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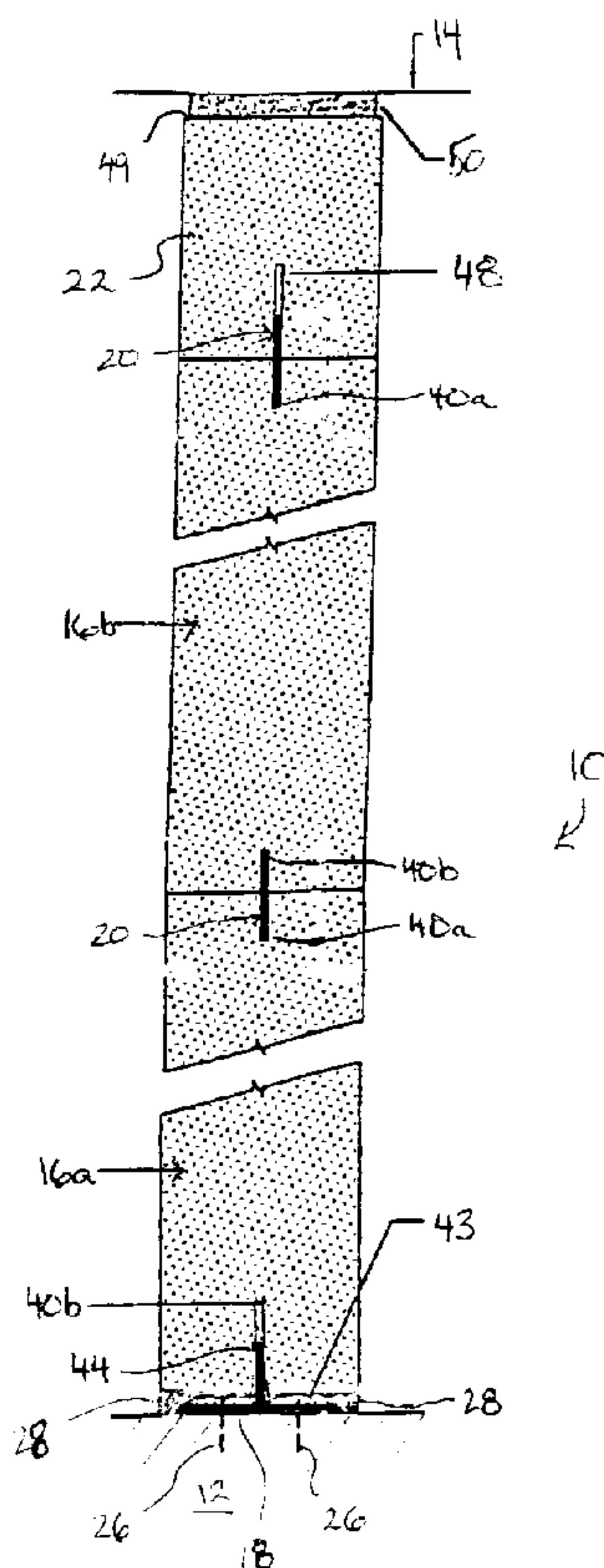
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(54) **SYSTEME DE SEPARATION MODULAIRE EN BLOCS DE
BETON DEPLACABLE**

(54) **RELOCATABLE MODULAR CONCRETE BLOCK PARTITION
SYSTEM**



(57) A light weight concrete partition construction which may be erected as a fire-rated wall consisting of a number of modular standard sized concrete blocks which are linked together by splines. The concrete blocks are made from autoclaved aerated concrete (AAC) having a density of less than 50 lbs. per cubic foot. The partition system incorporates a sufficient number of rectangular blocks used to form the partition wall or walls, having the desired height and width. The blocks have a generally rectangular shape with parallel and coplanar top and bottom surfaces, joined at parallel edge surfaces which extend perpendicularly thereto. Grooves are formed across the top and bottom surfaces of the blocks, aligned with a mid-plane of the blocks. To form a fire-rated wall, the splines are used to link successive courses of wall blocks to each other without mortar by partially locating with both the top grooves formed in the wall blocks of the underlying course, and the bottom grooves of overlying course of wall blocks which rest directly thereon. The splines are formed as elongated rectangular bars which have a thickness which is marginally less than the lateral width of the grooves formed in the wall blocks.



ABSTRACT

A light weight concrete partition construction which may be erected as a fire-rated wall consisting of a number of modular standard sized concrete blocks which are linked together by splines. The concrete blocks are made from autoclaved aerated concrete (AAC) having a density of less than 50 lbs. per cubic foot. The partition system incorporates a sufficient number of rectangular blocks used to form the partition wall or walls, having the desired height and width. The blocks have a generally rectangular shape with parallel and coplanar top and bottom surfaces, joined at parallel edge surfaces which extend perpendicularly thereto. Grooves are formed across the top and bottom surfaces of the blocks, aligned with a mid-plane of the blocks. To form a fire-rated wall, the splines are used to link successive courses of wall blocks to each other without mortar by partially locating with both the top grooves formed in the wall blocks of the underlying course, and the bottom grooves of overlying course of wall blocks which rest directly thereon. The splines are formed as elongated rectangular bars which have a thickness which is marginally less than the lateral width of the grooves formed in the wall blocks.

RELOCATABLE MODULAR CONCRETE BLOCK PARTITION SYSTEM

SCOPE OF THE INVENTION

The present invention relates to a relocatable modular partition system which may be used as a full or partial-height wall or cubicle construction in factories, healthcare, or long-term care facilities, warehouses, retail or office space, and more particularly to a concrete block system which permits the simplified onsite erection of a relocatable partition designed to function as a space-dividing wall or as a fire-rated wall, without requiring mortar.

BACKGROUND OF THE INVENTION

It is known to provide cubicles and partitions in warehouses, laboratories, manufacturing plants and office spaces. To achieve a firewall rating, as for example, where a partition wall is to contain flammable substances or protect sensitive equipment or documents from fire damage, conventional firewalls have been formed from cinder block construction. The use of cinder blocks necessitates that the office cubicle or wall be permanently erected by masons using concrete mortar.

Conventional partition systems suffer the disadvantage in that to install the partitions, it is often necessary to custom design the enclosure prior to installation. After the design stage, skilled tradesmen must then be employed to erect the cinder block partition. In addition to increased construction costs, conventional firewall partitions suffer the significant disadvantage in that they are formed as permanent constructions and may not be modified or disassembled. If change is required, as in expansion of a tenant's rented retail premises, conventional firewall partitions must be destroyed, removed to a waste dump, and rebuilt with new material in the desired new location.

A further disadvantage of conventional concrete wall systems exists in that when erected, the cinder block wall will typically have a density of about 150 lbs. per cubic foot. The weight

of such concrete walls therefore limits installation sites to newer constructions which have reinforced concrete floors adapted to support increased loads.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present to overcome the disadvantages of the prior art by providing a partition system which is easily adaptable for installation as a modular construction in almost any configuration.

Another object of the invention is to provide a partition system having walls formed from modular block units which may be erected without the use of mortar or the hiring of specialized tradesmen.

A further object of the invention is to provide a partition system which permits simplified disassembly after its erection, enabling the components to be reused or relocated to another site.

Another object of the invention is to provide a modular partition system which may function effectively as a fire rated wall.

A further object of the invention is to provide a modular wall which is characterized by a concrete block construction formed having an overall density of less than 50 lbs. per cubic foot, so as to permit the erection of a partition or enclosure in almost any factory, healthcare or long-term care facilities, office, warehouse or retail establishment.

The inventor has appreciated an improved light weight concrete partition construction which may be erected as either a partial enclosure, workstation divider or even as a fire-rated wall. The partition construction consists of a number of modular standard sized concrete blocks which are linked together by splines. The concrete blocks are made from autoclaved aerated concrete (AAC) having a density of less than 50 lbs. per cubic foot, preferably 20 to 40 lbs. per cubic foot, and most preferably 30 to 34 lbs. per cubic foot. The use of AAC enables the blocks to be easily transported and assembled into a partition construction in almost any environment.

In its simplest form, the partition system incorporates a sufficient number of rectangular blocks used to form the partition wall or walls having the desired height and width. In a highly preferred configuration, the blocks are formed with a length of about 24 inches, a width of 16 inches, and a thickness of approximately 4 inches. This size permits the blocks to be easily handled and lifted into place, and, in the appropriate configuration, provides the partition with fire rating properties. However, larger or smaller blocks may also be used, depending upon the intended application.

The principal blocks which are used to form the walls have a generally rectangular shape with parallel and coplanar top and bottom surfaces, joined at parallel edge surfaces which extend perpendicularly thereto. Grooves are formed across at least the top and bottom surfaces of the blocks, and preferably the grooves extend along the two of the edge surfaces as well. The grooves are preferably aligned with a mid-plane of the block and have the identical profile, extending as a parallel sided slot inwardly into the block a distance of between 0.5 to 5 inches, and optimally about 1 inch. The grooves have a lateral width which is selected so as to not interfere with the lateral integrity of the wall block. Depending on the overall block thickness, the groove width is optimally less than about 1 inch, and more preferably about 0.1 inch. The use of autoclaved aerated concrete is particularly advantageous in the manufacture of the modular blocks, as the finished blocks and the grooves may be readily cut by the use of a circular concrete blade or simple machine tools. The cutting of the wall blocks and grooves advantageously ensures that the modular blocks are formed to exacting uniform tolerances.

The splines used to connect the blocks are made of metals such as steel, aluminum or other metal alloys. The splines are used to link successive courses of wall blocks to each other without mortar by partially locating with both the top grooves formed in the wall blocks of the underlying course, and the bottom grooves of overlying course of wall blocks which rest directly thereon. To achieve a fire-rated wall, the splines are preferably also inserted into the vertical grooves between abutting blocks at each end. In a simplified construction, the splines are formed as elongated rectangular bars which have a thickness which is marginally less than the lateral width of the grooves formed in the wall block. Splines of various lengths may be used,

however, optimum wall stability may be achieved where the horizontally positioned splines have a length which approaches that of the total wall length. Most preferably, the splines have a standard length of 8 to 12 feet.

To ensure that the splines do not interfere with the stacking of the wall blocks on top of each other or their placement end-to-end, each spline has a width which is marginally less than twice the depth of the grooves. Where aluminum alloys are used, the splines preferably have a width of marginally less than about 5 inches where 2.5 inch deep slots formed in the blocks, and marginally less than about 2 inches where 1 inch deep slots are used. The spline has a lateral thickness of between about .1 to .05 inches, and most preferably .08 inches to provide the desired wall stability and fire-rating properties.

One or more elongated T-shaped aluminum or other metal extrusions may also be used in the assembly of the modular partition construction. The T-shaped extrusions are characterized by a projecting tongue which extends outwardly from the back of the extrusion a distance marginally less than the depth of the slots formed in the rectangular wall blocks. Like the splines, the tongue has a thickness marginally less than the lateral width of the slot.

In one possible partition wall assembly, the T-shaped extrusion is placed or secured to the floor by screws, nails, caulking, glue, grout or the like. The first course of blocks is then placed in position on the extrusion so that the tongue is received in the bottom slot of each block. After the first course of blocks is positioned, successive courses of blocks are added. A spline is positioned between each course extending longitudinally in the direction of the top and bottom grooves of the blocks forming the adjacent courses. The insertion of the spline in the top grooves ensures that the blocks in the course are aligned with their edge surface of adjacent blocks aligned in juxtaposition. The insertion of the spline in the upper slots also provides stability to the wall. After the spline is in place, the next overlying course of blocks is positioned directly on to the preceding course, with the spline thereafter being received in the bottom slot of each block of the overlying course.

If desired, a T-shaped extrusion may be used as a cap rail to finish partition walls which do not extend fully to the overlying ceiling. Here, the tongue is inserted within the top groove of the uppermost course of blocks to provide both stability to the upper edge of the top course of blocks leaving the back of the extrusion exposed for a more refined appearance. Similarly, if openings for door or windows are desired, the T-shaped extrusion may be vertically positioned with the tongue inserted in the grooves formed in the vertically aligned edge portions and the grooves formed in the horizontally aligned edge portions of the wall blocks which border the opening.

Where the partition is to be used as a fire-rated wall, the splines are also inserted in the aligned vertical grooves of adjacent blocks. A cap block is preferably also provided which forms a connection with the overlying roof or ceiling. The cap block is formed from AAC in a similar manner to the modular wall blocks. The cap block is characterized by a lower bottom groove which when the cap block is moved into place, aligns with the top groove formed in the underlying course of modular wall blocks. The bottom groove in the cap block is cut to double height of those in the wall blocks and is marginally greater than the overall spline width. This permits a spline to be fully positioned therein when the cap blocks are initially placed. As the bottom groove of the cap blocks are moved into alignment with the top grooves in the underlying course of modular blocks, the spline drops under gravity into position so as to be partially disposed in both the top groove of the underlying course of modular blocks, and the lower half of the upper groove which is formed in the cap block.

Grout or other non-combustible filler may be buttered onto the top of the cap block to backfill any gap which may exist between the cap block and the overlying roof, ceiling or floor slab. More preferably, the T-shaped extrusion which is used as the wall/floor support may also be underfilled and leveled with fire retardant materials, such as grout, to ensure a fire retardant seal along the lower edge of the partition and along the vertical edges of the partition.

In the formation of free-standing cubicles, separate L-shaped corner blocks may be provided. The L-shaped corner blocks are similarly formed from the same autoclaved aerated concrete as the modular rectangular wall blocks. The corner blocks preferably have the same

vertical dimension as the wall blocks with planar upper and lower surfaces. The top and bottom grooves corresponding in depth and width to those in the wall blocks extend along the mid-plane following the block L-shape, bending 90° with the block. To connect the corner blocks to abutting modular wall blocks, splines from abutting courses of wall blocks may be extended into the corner block in essentially the same manner as with the modular wall blocks. Alternately, corner splines bent at a 90° angle may be provided which extend from the corner block in both directions into the adjacent courses of wall blocks.

Other mechanical fasteners may also be provided to secure a number of adjacent blocks, depending upon the overall load applications for the wall. In one simplified embodiment, table or draw bolts are used to mechanically couple laterally adjacent pairs of blocks to each other. Where table bolts are used, depressions are formed in either the upper or lower surfaces of adjacent blocks aligned with the grooves. The depressions extend inwardly into the block a sufficient distance as to permit the bolt or other mechanical fasteners to lie below the top or bottom surfaces of the blocks so as not to interfere with the placement of succeeding courses of block. Where larger bolts are used, the portion of the grooves extending from the circular depression to the abutting edges may be enlarged. While table bolts present a preferred mechanical fastener, it is to be appreciated that other mechanical fasteners, including conventional carriage bolts, clips, clamps and the like are also possible.

Accordingly in one aspect the present invention resides in a modular partition construction comprising,

a plurality of generally rectangular blocks, comprising autoclaved aerated concrete having a density selected at between about 20 and 40 lbs. per cubic foot, each said rectangular block having generally parallel planar top and bottom surfaces, generally parallel planar end surfaces, and top and bottom parallel sided grooves formed in each of said top and bottom surfaces, respectively, the top and bottom grooves extending longitudinally into both of said end surfaces and having a lateral width of less than about 1 cm,

at least one substantially planar metal spline having a lateral thickness marginally less than the lateral width of each of said top and bottom grooves to permit insertion of said spline therein, and

wherein in assembly a first rectangular block is coupled to a second rectangular block with the bottom surface of the first block abutting at least part of the upper surface of the second block and a first one of the metal splines disposed in part in each of the bottom groove of the first block and the top groove of the second block.

In another aspect the present invention resides in a modular wall construction comprising, a plurality of identical generally rectangular blocks, each of said rectangular blocks consisting of autoclaved aerated concrete and having an overall density selected at between about 30 and 40 lbs. per cubic foot and having generally parallel planar top and bottom surfaces, generally parallel planar end surfaces oriented generally perpendicularly to said top and bottom surfaces, and a parallel sided groove formed in each of said top, bottom end surfaces, each of said grooves being substantially co-planar with a mid-plane of said block and having an identical lateral width selected at about less than about .1 inches and an identical depth selected at about less than two inches,

a plurality of planar metal splines, each of said splines formed as a generally rectangular member having a lateral thickness marginally less than the lateral width of said grooves to permit insertion of said spline therein,

wherein in assembly a first rectangular block is coupled to a second rectangular block with the bottom surface of the first block directly abutting at least part of the upper surface of the second block and a first one of the metal splines disposed in part in each of the grooves formed in the bottom surface of the first block and the groove formed in the top surface of the second block.

BRIEF DESCRIPTION OF THE DRAWINGS

Further aspects and advantages of the present invention will appear from the following description taken together with the accompanying drawings in which:

Figure 1 is a cross-section view of a modular concrete block partition erected as a fire-rated wall in accordance with a first embodiment of the invention;

Figure 2 is a perspective schematic view of a modular concrete wall block used in the fire-rated wall shown in Figure 1;

Figure 3 is an exploded partial view of the spline and two vertically adjacent courses of wall blocks used in the partition shown in Figure 1;

Figure 4 is a partial perspective view of an assembled wall shown in Figure 1 coupled to an existing partition wall;

Figure 5 is a partial cross-sectional view of the wall of Figure 4 taken along line 5-5' showing the anchoring of the modular partition construction to the existing partition wall;

Figure 6 is a plan view of a corner block and corner spline for use with the present invention;

Figure 7 is a cross-sectional view of a doorway for use with a partition enclosure in accordance with the present invention;

Figure 8 shows a partial perspective view of a partition wall assembled in accordance with a further embodiment of the invention;

Figure 9 shows a perspective top view of a mechanical coupling of the corner block of Figure 6 with modular wall blocks shown in Figure 2 in accordance with a further embodiment of the invention; and

Figure 10 shows a partial perspective view of the upper extent of the modular block partition assembled as a fire-rated wall in accordance with a further embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference is now made to Figure 1 which shows a preferred modular wall construction 10 which has been erected as a fire-rated wall extending from a concrete slab floor 12 to a ceiling 14. As will be described, although the wall construction 10 is shown as a fire-rated wall, the modular nature of the system makes it also suitable for office and conference room walls, low partitions and counters, free standing factory offices as well as bank machine and retail enclosures.

The basic wall construction 10 includes as its principal components a number of modular generally rectangular wall blocks 16 which form the principal building components of the wall partition 10, at least one T-shaped aluminum alloy extrusion 18, a number of elongated aluminum alloy splines 20, and an uppermost course of cap blocks 22.

Figures 2 and 3 show best the modular wall blocks 16 used in the erection of the wall construction 10. The wall blocks 16 are formed from non-reinforced autoclaved aerated concrete (AAC) which has a density of between about 20 and 40 lbs. per cubic foot, and more preferably about 30 to 34 lbs. per cubic foot. The use of autoclaved aerated concrete advantageously provides the wall construction 10 with a lower overall mass, enabling the wall to be easily transported and erected. As well, the use of AAC allows the blocks 16 to be cut with conventional saws to exact tolerances, ensuring that the block surfaces are flat and uniform. In the conventional wall partition construction 10 shown, the blocks 16 are rectangular having a longitudinal length l of about 24 inches, a height h of about 16 inches and are optimally 4 inches thick. It has been found that this configuration advantageously achieves a fire resistance of CAN-S-101 with a three hour fire resistance rating. The AAC provides thermal insulation properties of ASTM C-236 at 0.9 BTU per hour per square foot per °F. per inch. The sound transmission of the blocks in testing has achieved STC 41. As well, the AAC is an inert material which does not contribute to indoor or environmental pollution.

Figure 2 shows best the block as including parallel planar top and bottom surfaces 32,34, and planar parallel edge surfaces 36,38 which extend perpendicularly thereto. A 1 inch deep groove 40a,40b,40c,40d is formed along each of the block surfaces 32,34,36,38, respectively. The grooves 40a,40b,40c,40d are positioned at the longitudinal mid-plane of the block 16, dividing it symmetrically in the longitudinal direction into right and left halves. The grooves 40a,40b,40c,40d are identically formed as a narrow slot having parallel side walls and a lateral width formed at between about .15 and .05 inches, and most preferably about .09 inches. By forming the grooves 40a,40b,40c,40d with the same dimension, each aligned with the block mid-plane, the blocks 16 may be erected without regard to whether the right or left halves of the block face inwardly or outwardly or which planar surface 40a,40b faces upwardly. Although not

essential, the blocks 16 and 20 may be provided with a sealant or colored coating to reduce chalking, and achieve a more enhanced esthetic appearance.

The horizontal aluminum splines 20 are formed having a generally rectangular construction with a width of marginally less than two inches and a thickness selected marginally less than the lateral width of the grooves 40a,40b,40c,40d, and preferably about .08 inches.

The T-shaped extruded track 18 is shown best in Figure 1 as having a planar back 43 and a flattened tongue 44 which projects at right angles from a longitudinal middle portion of the back 43. The tongue 44 projects from the back 43 a preferred distance of between about .75 inches to marginally less than 1 inch so as to permit it to be fully received in the bottom groove 40b formed in the bottom surface 34 of a block 16. In this manner, the lowermost course of blocks 16a (Figure 1) can be positioned on the T-shaped track 18 so that the tongue 44 is received entirely within the bottom groove 40b.

The tongue 44 preferably is also formed with a thickness selected marginally less than the lateral width of the grooves 40a,40b,40c,40d, and preferably which is selected at approximately 0.08 inches. With this dimension, when the tongue 44 is received in one of the grooves 40a, 40b,40c,40d, the engagement of the tongue 44 with the parallel sidewalls of the grooves 40 prevent twisting of the blocks 16 relative thereto.

The wall partition is preferably sold in the form of a stock sized pre-engineered kit which is ready for assembly. Preferably, both the T-shaped extruded tracks 18 and splines 20 extend the horizontal length of the modular wall construction 10. In this regard, when the construction 10 sold as unassembled pre-engineered kits, the extruded track 18 and splines 20 are provided in standard 8, 10 or 12 foot lengths. It is to be appreciated, however, that where necessary, customized partition constructions may be designed with minor modifications.

The partition construction 10 shown in Figure 1 is of a floor anchored configuration in which the T-shaped extruded track 18 is initially secured to the floor by screws 26 (Figure 1) in alignment with the desired positioning of the wall construction 10. In addition, the back 43 of

the T-shaped track 18 may be first buttered with grout 28 to compensate for any irregularities in the floor surface and provide a fire break beneath the assembled construction 10.

Figures 1 and 3 show best the placement of a first lowermost course of blocks 16a on the T-shaped extruded track 18, and the positioning of subsequent courses of blocks 16b thereon. The bottom course of blocks 16b is merely placed over the track 18 so that the tongue 44 locates within the groove 40b formed in the bottom surface 34 of each block 16a. The blocks 16a are positioned on the T-shaped track 18 with the edge surfaces 36,38 of adjacent blocks 16a in abutting contact. It is to be appreciated that as successive blocks 16a are moved into place, the engagement of the tongue 44 within the bottom grooves ensures the proper alignment of the bottom course of blocks 16a at the desired location.

To secure the succeeding overlying course of blocks 16b to the bottom course 16a, a spline 20 is inserted into the upper slot 40a which is formed in the upper surface 32 of each block 16a. The insertion of the spline 20 into the slots 40a ensures alignment of the top surfaces 32 of the lower course blocks 16a and prevents the blocks 16a from moving relative to each other. The next course of blocks 16b is then positioned with their bottom surfaces 34 straddling the top surface 32 of two underlying blocks 16a, so that the spline 20 is also partially disposed in the bottom slots 40b of the blocks 16b. The spline 20 has a lateral width which is marginally less than the total depth of the upper slots 40a formed in the top of the lower course blocks 16a and the bottom slots 40b formed in the overlying course of blocks 16b. With this construction, the spline 20 is fully received in the aligned slots 40a,40b, and does not interfere with the stacking of the blocks 16a,16b directly on top of each other. It is to be appreciated that further succeeding courses of blocks 16 are assembled in the identical manner until either a partition wall of the desired height is achieved or the uppermost course of blocks 16 locates approximately a distance equal to the height of the cap blocks 22 from the ceiling 14.

Because the blocks 16 and splines 20 are assembled without mortar, if desired, the partition 10 may be easily disassembled later for re-use elsewhere.

Figure 1 shows the cap blocks 22 used to form the fire-rated partition 10. The cap blocks 22 are also formed from non-reinforced AAC, and differ from the wall blocks 16 in that they include only a bottom groove 48. The cap block groove 48 is formed with approximately double the depth of the grooves 40 which are formed in the modular wall blocks 16. The increased depth permits a spline 20 to be fully inserted within the slot 48 while the cap blocks 22 are moved into position above the uppermost course of wall blocks 16. Once the blocks 22 are moved into alignment with the underlying courses of wall blocks 16, their slots 48 align with the upper groove 40a formed in the underlying course of modular wall blocks 16. When the grooves 48 and 40a align, the spline 20 will drop under gravity to the position shown in Figure 1 straddling part of the bottom groove 48 in each cap blocks 22 and the upper grooves 40a of the underlying modular wall blocks 16.

For firewall rating, additional grout 50 may be buttered on the upper surface 49 of the cap block 22 to complete the fire break and ensure that no gaps in the erected wall exist between the floor 12 and ceiling 14.

Figures 4 and 5 shows a perspective partial view of a preferred wall construction wherein the wall blocks 16 are staggered relative to those of each preceding and successive course, and with an edge of the partition 10 coupled to an existing partition wall 52. To secure the construction 10 to the partition 52, a further T-shaped extruded track 58 is used. The track 58 is identical to the track 18 and is mounted with the back 45 of the track 58 coupled to the partition 52 by screws 54, so that the tongue member 44 of the track 58 extends vertically. With this configuration, the tongue 44 of track 58 locates within an edge slot 40c formed in the edge surface 36 of the blocks 16 which are immediately adjacent to the partition 52. To permit the corner cap block 22a (Figure 4) to be slid in place, the guide track 58 extends from the floor 12 only to the uppermost edge of the top course of modular wall blocks 16.

Figure 6 shows a specialized corner block 62 used in the erection of free standing office enclosures and which is used to join two adjacent courses of blocks 16 at a 90° angle. The corner block 62 is L-shaped having two mutually perpendicular end surfaces 68,70. The block 62 and has an overall height of 16 inches and a width of 4 inches, corresponding to those of the

modular wall blocks 16. An L-shaped groove 64 is formed down the medial center of the corner block 62. The groove 64 has a corresponding depth and lateral width as the slots 40a,40b,40c,40d formed in the modular blocks 16. An L-shaped aluminum spline 66 having a width corresponding to the splines 20 and a thickness of approximately .08 inches is inserted in the groove 64 to couple the corner blocks 62 to the adjacent courses of blocks 16. Most preferably, the spline 66 extends beyond the end surfaces 68,70 of the corner block 62 in both directions approximately mid-way across the next adjacent wall block 16.

Figure 7 shows the assembly of the wall blocks 16 in the formation of a door jamb 74 permitting access to an enclosure formed with the modular wall construction 10. To form the door jamb 74, courses of the bordering wall blocks 16c are assembled with the desired spacing. A pair of T-shaped aluminum extruded tracks 78 identical to the T-shaped extruded track 18 are then positioned with the tongue 44 of each track 78 inserted into the vertically extending edge grooves 40c,40d slots formed in the opposing edge surfaces 36,38 of the wall blocks 16c. After placement, the tracks 78 are secured in place by screws 79. . Once the door opening is roughed in, a door may be secured in place in a conventional manner.

Although Figure 4 illustrates the construction of a wall in a conventional staggered manner, the invention is not so limited. Figure 8 shows an alternate possible wall construction 10 wherein like reference numerals are used to identify like components and in which the edge surfaces 36,38 of each wall block 16 are aligned. With the construction 10 shown, the splines 20 are again positioned so as to extend the horizontal length of the wall construction 10 straddling both the top and bottom grooves 40a,40b formed in adjacent lower and upper courses of blocks 16.

While Figure 7 illustrates a bent spline 66 as being used to connect a corner block 62 to adjacent wall blocks 16, the invention is not so limited. Figure 9 shows an alternate mechanical connector used to couple the corner block 62 to adjacent wall blocks 16. In Figure 9, table or draw bolts 80a,80b are used to maintain the blocks 62,16 with their end surfaces in abutting juxtaposition. To position the table top bolts 80a,80b, 1 inch deep circular recesses 82 are drilled in the top surfaces of the corner block 62 and wall blocks 16 approximately 1 inch inwardly from

the block edge surfaces which are to be positioned in juxtaposition. The recesses 82 are formed having a size and depth so as to permit the table top bolts 80a,80b to be positioned and tightened therein so as not to interfere with the placement of successive courses of blocks 16,62 thereon. If necessary, the portion of the grooves 40 between the recesses 82 and block edges may be enlarged to permit insertion of larger fastened bolts. It is to be appreciated that a modular wall construction 10 may be erected without having to mechanically secure all of the adjacent blocks to each other with bolts 82. Rather, depending upon the height and length of the wall construction 10, only key blocks may be mechanically coupled to each other to provide overall enhanced structural integrity to the wall construction 10. Similarly, it is envisioned that where smaller or only partial partitions are desired, the use of the corner bolts 80a,80b may be omitted in their entirety.

Figure 10 shows a modular partition construction 10 in accordance with a further embodiment of the invention, and wherein like reference numerals are used to identify like components. The partition construction 10 of Figure 10 incorporates a plurality of wall blocks 16 as shown in Figure 2. The wall blocks 16 are linked to each other by horizontally placed splines 20 in the identical manner as described with reference to Figure 1. In addition, a number of shorter vertical splines 95 are positioned in the aligned grooves 40c,40d formed in the abutting edge surfaces of adjacent blocks 16. The vertical splines 95 are formed from extruded aluminum having the identical width and thickness as splines 20.

In assembly, the vertical splines 95 of each course of blocks 16 are slid into place prior to placing the spline 20 horizontally in the top grooves 40a of each course of blocks 16.

The partition of Figure 10 incorporates only a single cap block 22 as a "key". To complete the upper course, a T-shaped extrusion 96 identical to extrusion 18 and a spline 20a, each having a shortened length selected at the partition width less than the width of the cap block 22, are secured to the ceiling 14 and underlying row of wall blocks 16', respectively. Fire rated grout 28 is again buttered on the side of the extrusion 96 which is placed in contact with the ceiling 14.

Prior to installing the cap block 22, the upper course of blocks 16" are then individually slid horizontally into place with the tongue of the extrusion 96 received in their upper slot 40a and the spline 20a received in their lower slot 40b. After each block 16" is moved into place, a vertical spline 95 is positioned in its exposed edge slot 40c. The next horizontally adjacent block 16" is then moved into place so that the exposed edge of the spline 95 locates in the adjacent edge slot 40d.

Once the upper course of wall blocks 16" is in place leaving only space for the key, the cap block 22 is positioned using a short spline 20b in the manner previously described. Most preferably, the top and side edges of the cap block 22 are buttered with grout to achieve a maximum fire-rating.

Although the detailed description of the invention discloses the splines 20 and T-shaped extruded tracks 18 as extending the lateral width of the wall 10, the invention is not so limited. If desired, a number of shorter splines 20 and tracks 18 could also be used and will now become apparent. Similarly, while the use of aluminum alloys presents various advantages in workability, weight and fire resistance, the invention is not so limited. If desired, the splines 20,95 and T-shaped extrusions 18,58,96 could equally be made from other metals, such as steel, copper or other alloys.

While blocks of approximately 2 feet by 1.3 feet advantageously permit ease of portability and assembly of the modular partition construction 10, the invention is not so limited. It is envisioned that the present invention may also be used with smaller or larger block members. By way of one non-limiting example, it is envisioned that modular blocks extending up to 20 feet in length, may be used where the partition 10 is to be erected for use in commercial applications such as in the formation of retail space enclosures.

While the alignment of the grooves 40a,40b,40c,40d with the mid-plane of the block 16 advantageously increases the modular nature of the blocks, the invention is not so limited. In a less preferred embodiment, the grooves 40 could be provided off-center along the blocks 16,62 without departing from the spirit of the invention.

Although Figure 1 illustrates the modular wall construction 10 as being anchored to the floor 12 by use of the T-shaped track 18, the invention is not so limited. If desired, the track 18 may be omitted and the lowermost course of blocks 16 and the wall could be erected as a floating wall without attachment to the underlying floor 12.

While Figure 1 shows use of a cap blocks 22 to provide a finished upper edge to the wall construction 10, the invention is not so limited. If only a partial partition is desired, or if the partition wall construction need not provide a fire-rated protection, the cap blocks 22 could be omitted. With such a construction, the top of the uppermost course of modular wall blocks 16 could be finished by inserting a further T-shaped extruded track identical to T-shaped track 18 in the upper groove 40a of the top course of blocks 16, in a mirror manner to the insertion of the T-shaped guide track 18 into the bottom grooves 40b.

While the preferred embodiment discloses the use of the T-shaped extrusion 18 as forming the base of the construction 10, the invention is not so limited. If desired, adjustable base assembly, as for example adjustable by jack-screws or the like, could also be used as a support for the partition.

Although the disclosure describes and illustrates preferred embodiments, the invention is not so limited. Many modifications and variations will now become apparent to a person skilled in this art. For a definition of the invention, reference may be had to the appended claims.

We claim:

1. A modular partition construction comprising,
a plurality of generally rectangular blocks, comprising autoclaved aerated concrete having a density selected at between about 20 and 40 lbs. per cubic foot, each said rectangular block having generally parallel planar top and bottom surfaces, generally parallel planar end surfaces, and top and bottom parallel sided grooves formed in each of said top and bottom surfaces, respectively, the top and bottom grooves extending longitudinally into both of said end surfaces and having a lateral width of less than about .5 inches,
at least one substantially planar metal spline having a lateral thickness marginally less than the lateral width of each of said top and bottom grooves to permit insertion of said spline therein, and
wherein in assembly a first rectangular block is coupled to a second rectangular block with the bottom surface of the first block abutting at least part of the upper surface of the second block and a first one of the metal splines disposed in part in each of the bottom groove of the first block and the top groove of the second block.
2. The modular partition construction as claimed in claim 1 wherein said top and bottom grooves are aligned with each other and a mid plane of the block and extend inwardly towards each other a depth of between about 0.5 to 4 inches.
3. The modular partition construction as claimed in claim 1 wherein each of said metal splines consists of an aluminum alloy and has a thickness selected at between about .15 and .05 inches.
4. The modular partition construction as claimed in claim 3 wherein each of said metal splines has a width of about 2 inches, and longitudinal length greater than the top and bottom grooves.
5. The modular partition construction as claimed in claim 1 further including an elongated T-shaped member, characterized by a planar tongue sized for insertion within either of the top or bottom grooves, wherein in assembly a lowermost course of said rectangular blocks is positioned over said T-shaped member with said tongue received in the bottom grooves of said blocks.

6. The modular partition construction as claimed in claim 1 wherein said rectangular blocks further include an edge groove extending from said top groove to said bottom groove in each of the end surfaces, said edge grooves having substantially the same lateral width and depth as said top and bottom grooves.

7. The modular partition construction as claimed in claim 1 further including a plurality of corner blocks, each of said corner blocks comprising autoclaved aerated concrete and having a density selected at between about 30 and 34 lbs. per cubic foot, the corner blocks characterized by substantially parallel planar L-shaped top and bottom surfaces, mutually perpendicular planar first and second end surfaces, and an L-shaped groove corresponding in size and depth to each of said top and bottom grooves extending along a medial line of each of said top and bottom surfaces.

8. A modular partition construction as claimed in claim 7 wherein said autoclaved aerated concrete has a density selected at between about 30 and 34 lbs. per cubic foot.

9. A modular partition construction as claimed in claim 1 wherein said spline comprises an aluminum alloy and has a width of about 2 inches and a thickness of between about .1 and .06 inches.

10. A relocatable modular wall construction comprising,

a plurality of identical generally rectangular blocks, each of said rectangular blocks consisting of autoclaved aerated concrete and having an overall density selected at between about 30 and 40 lbs. per cubic foot and having generally parallel planar top and bottom surfaces, generally parallel planar end surfaces oriented generally perpendicularly to said top and bottom surfaces, and a parallel sided groove formed in each of said top, bottom end surfaces, each of said grooves being substantially co-planar with a mid-plane of said block and having an identical lateral width selected at about less than about .1 inches and an identical depth selected at about less than two inches,

a plurality of planar metal splines, each of said splines formed as a generally rectangular member having a lateral thickness marginally less than the lateral width of said grooves to permit insertion of said spline therein,

wherein in assembly a first rectangular block is coupled to a second rectangular block with the bottom surface of the first block directly abutting at least part of the upper surface of the second block and a first one of the metal splines disposed in part in each of the grooves formed in the bottom surface of the first block and the groove formed in the top surface of the second block.

11. The modular wall construction as claimed in claim 10 wherein said grooves extend inwardly into the block to a depth of between about 0.5 to 1 inch.

12. The modular wall construction as claimed in claim 10 wherein each of said metal splines consists of an aluminum alloy and has a thickness selected at between about .15 and .05 inches.

13. The modular wall construction as claimed in claim 12 wherein each of said metal splines has a width of about 2 inches, and longitudinal length approximately equal to the modular wall construction.

14. The modular wall construction as claimed in claim 10 further including at least one cap block, each of said cap blocks consisting of said autoclaved aerated concrete and having a planar bottom surface, a pair of end surfaces and a parallel sided bottom groove extending along said bottom surface and into the end surfaces, the bottom groove of the corner block having a lateral width substantially corresponding to said groove in the top surface of the block, and extending inwardly therein to a depth at least as wide as said splines.

15. A modular partition construction as claimed in claim 1 wherein the modular wall construction as claimed in claim 10 further including a plurality of identical cap blocks, each of said cap blocks consisting of said autoclaved aerated concrete and having a planar bottom surface, a pair of end surfaces and a parallel sided bottom groove extending into the end surfaces, the bottom groove of the corner block having a lateral width substantially corresponding to said groove in the top surface of the block, and extending inwardly therein to a depth at least corresponding to a width of one of said splines.

16. A modular partition construction as claimed in claim 2 wherein the modular wall construction as claimed in claim 10 further including at least one cap block, each of said cap blocks consisting of said autoclaved aerated concrete and having a planar bottom surface, a pair

of end surfaces and a parallel sided bottom groove extending into the end surfaces, the bottom groove of the corner block having a lateral width substantially corresponding to said groove in the top surface of the block, and extending inwardly therein to a depth at least corresponding to a width of one of said splines.

17. A modular partition construction as claimed in claim 14 wherein the modular wall construction as claimed in claim 10 further including a plurality of identical cap blocks, each of said cap blocks consisting of said autoclaved aerated concrete and having a planar bottom surface, a pair of end surfaces and a parallel sided bottom groove extending into the end surfaces, the bottom groove of the corner block having a lateral width substantially corresponding to said groove in the top surface of the block, and extending inwardly therein to a depth at least corresponding to a width of one of said splines.

18. A modular partition construction as claimed in claim 6 further comprising at least one vertical spline member sized for insertion in said edge grooves wherein in assembly said vertical spline member locates in part in aligned vertical edge grooves of abutting blocks.

19. A modular wall construction as claimed in claim 10 further comprising at least one vertical spline member sized for insertion in said edge grooves wherein in assembly said vertical spline member locates in part in aligned vertical edge grooves of abutting blocks.

20. A modular wall construction as claimed in claim 14 further comprising at least one vertical spline member sized for insertion in said edge grooves wherein in assembly said vertical spline member locates in part in aligned vertical edge grooves of abutting blocks.

Fig. 2

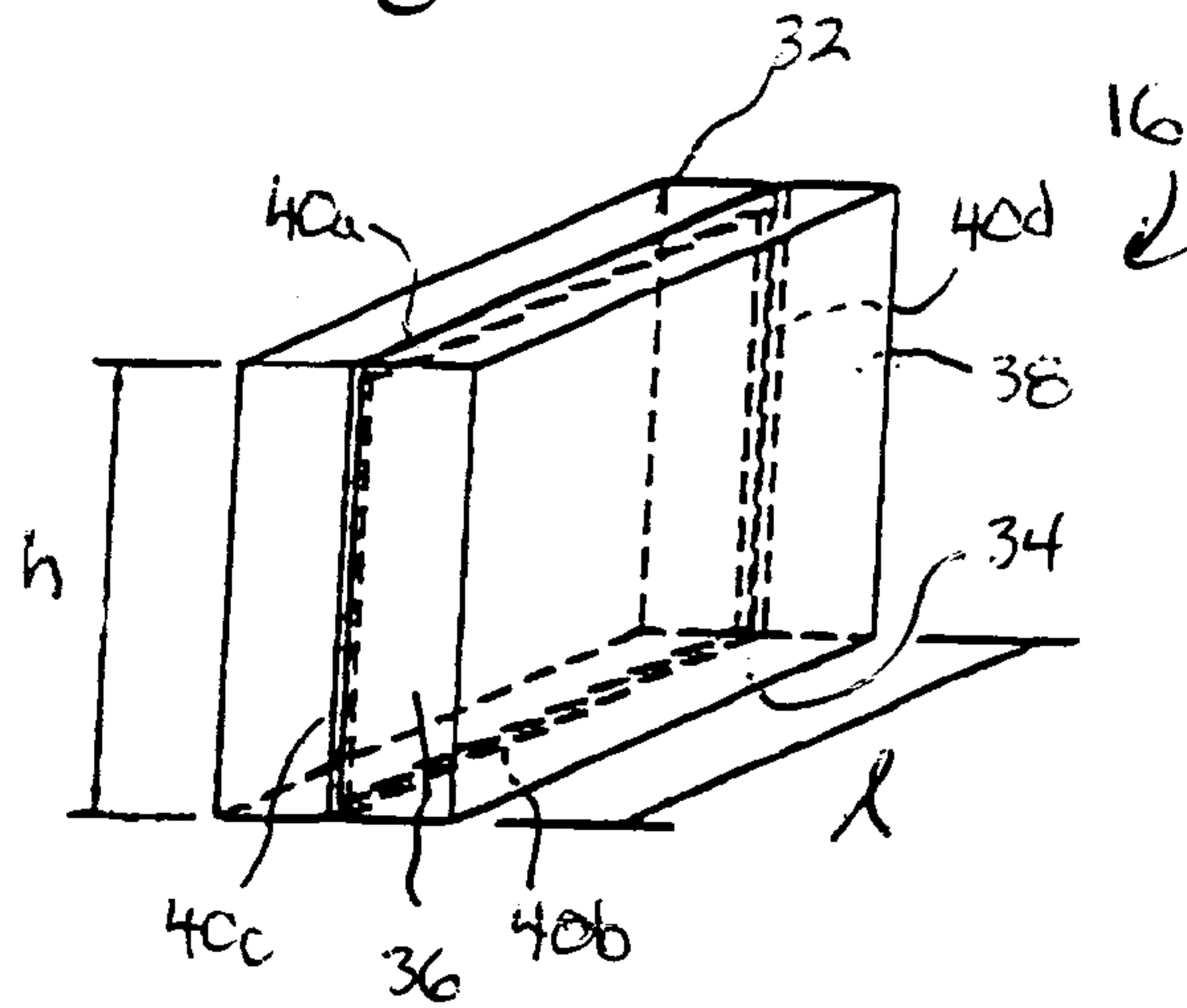


Fig. 3

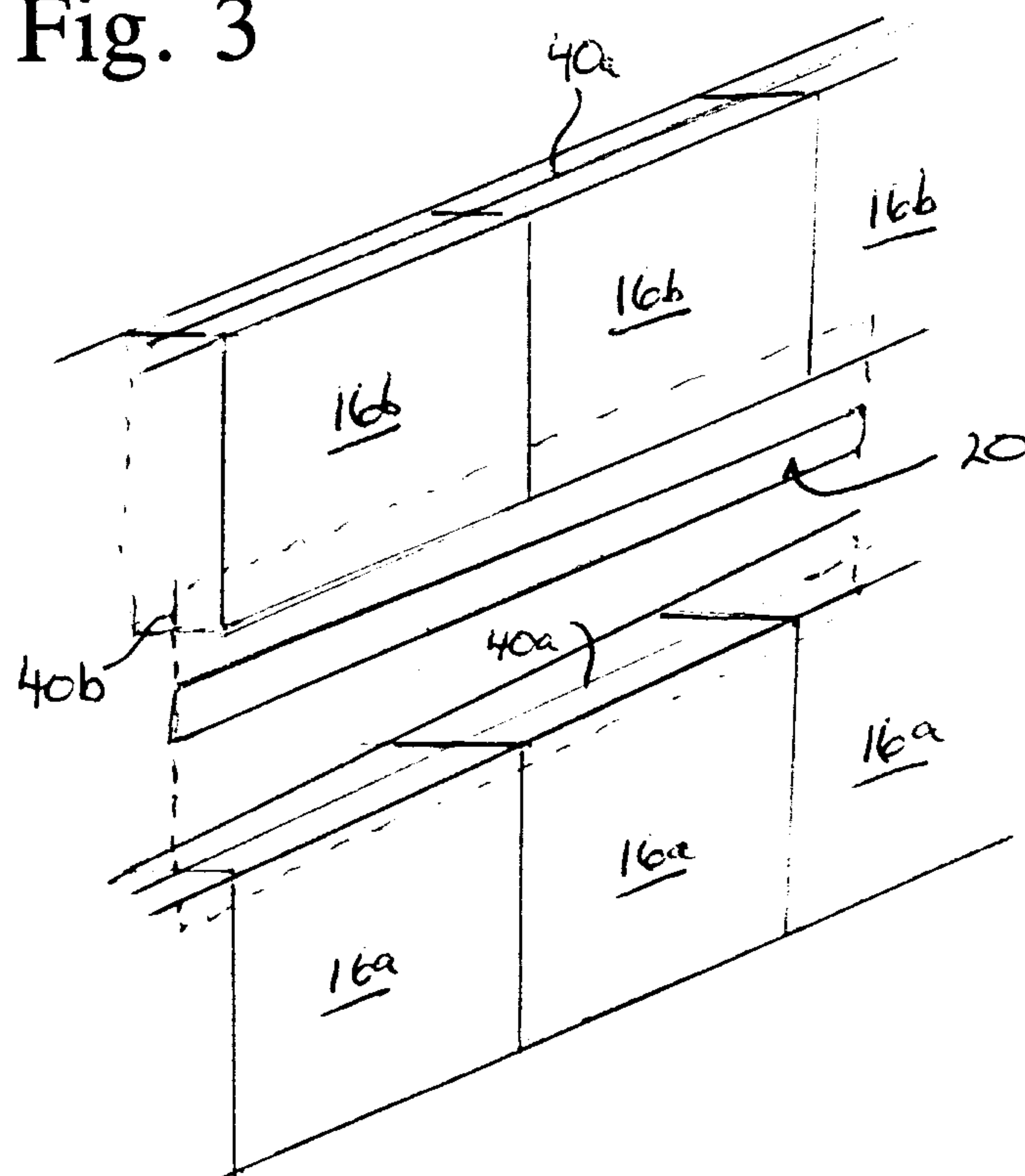


Fig. 4

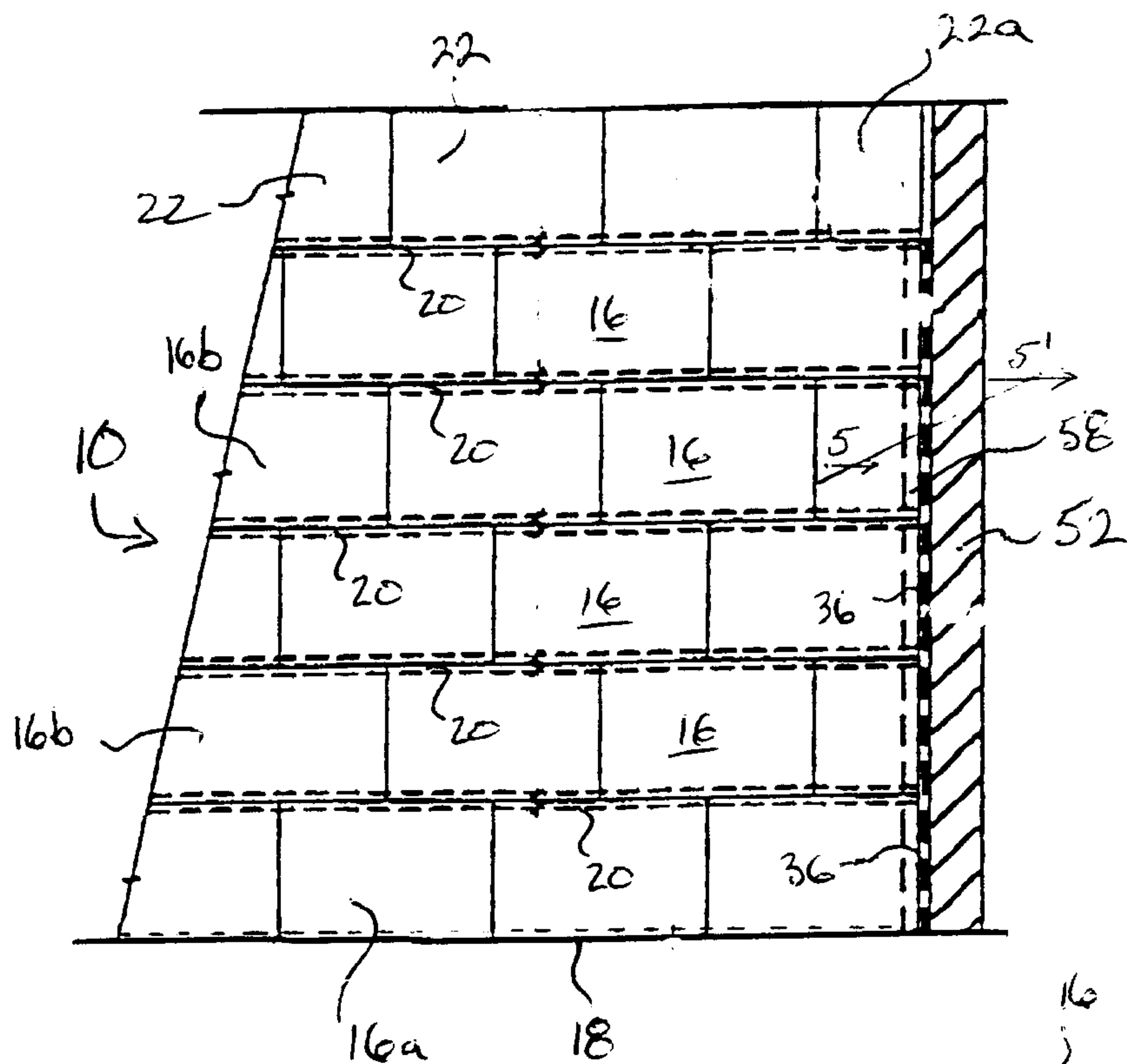


Fig. 5

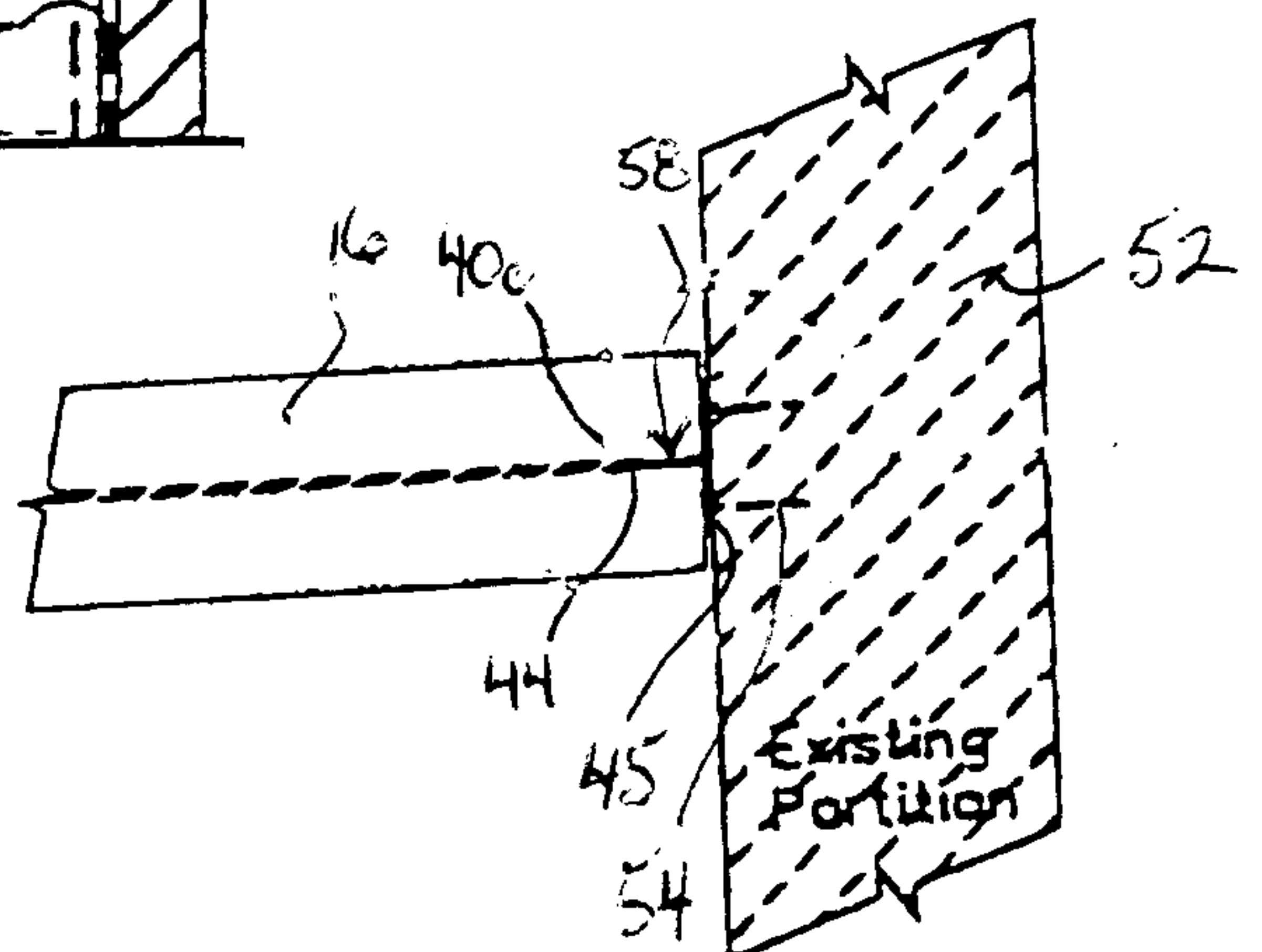


Fig. 6

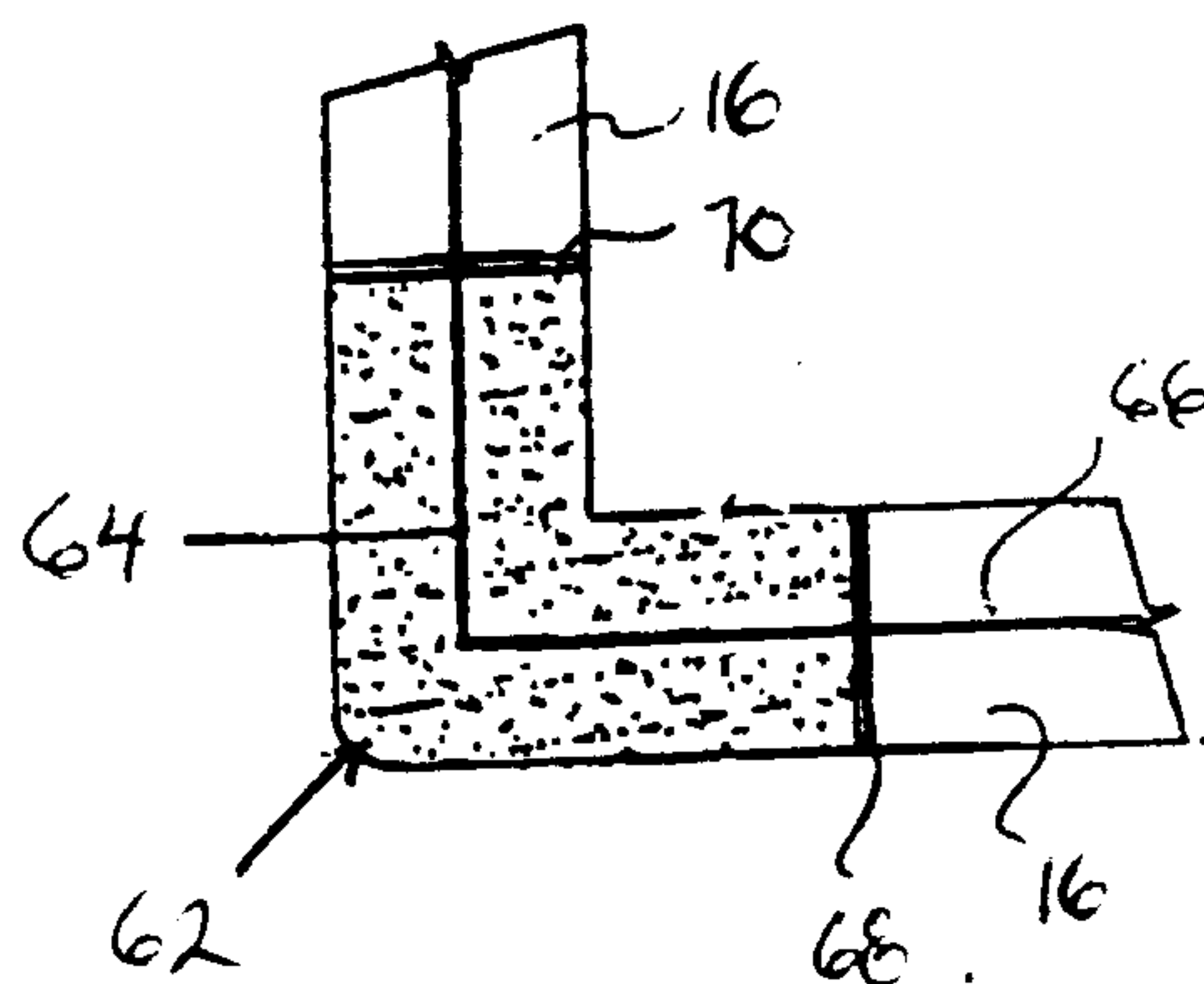


Fig. 7

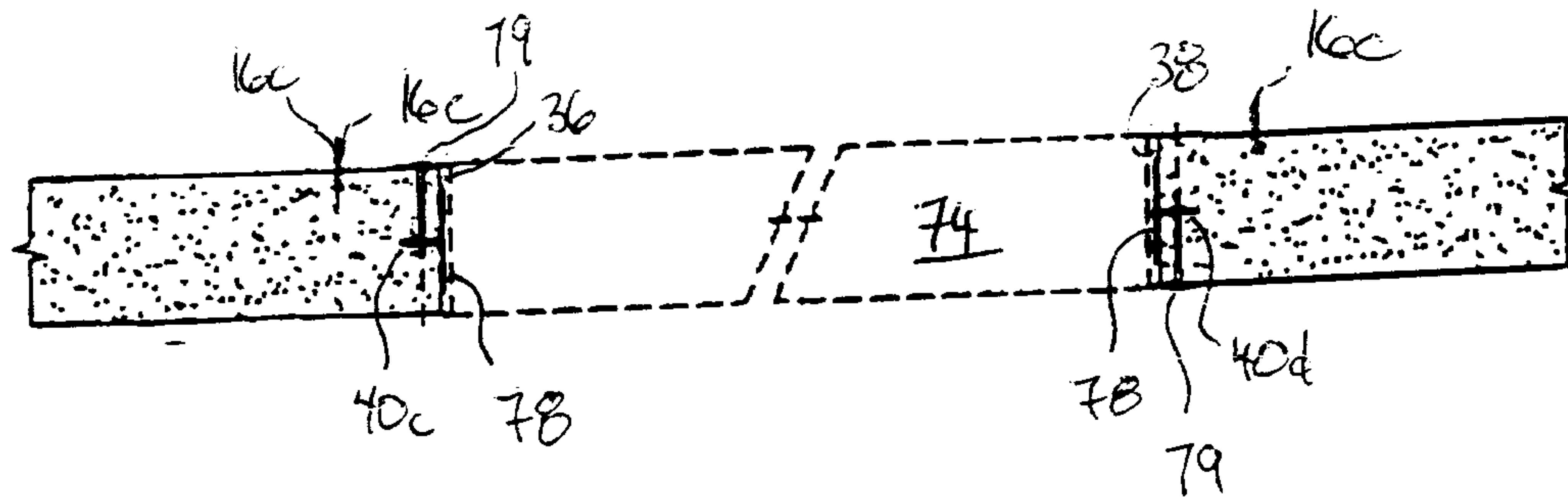


Fig. 8

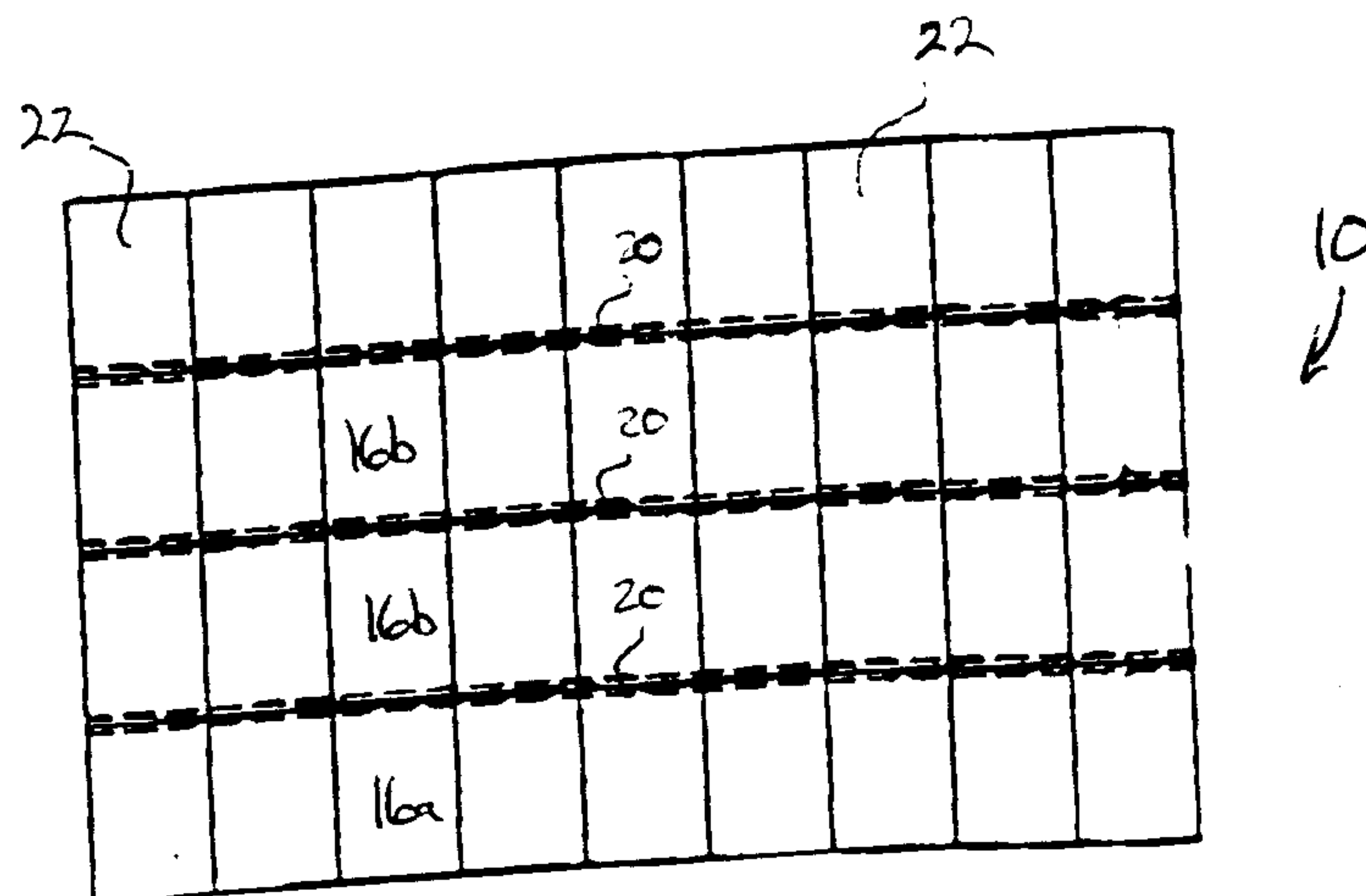


Fig. 9

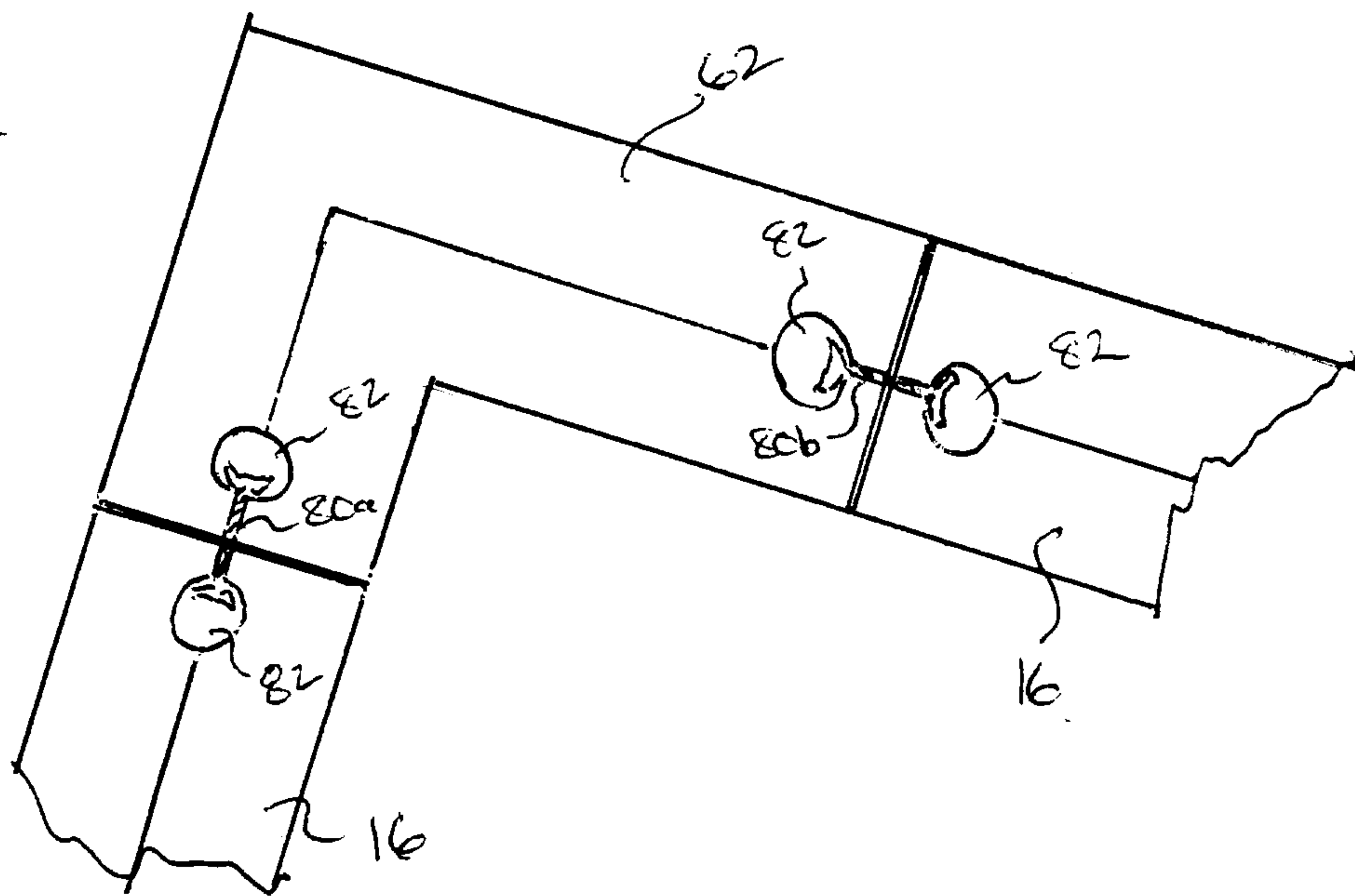


Fig. 10

